shall be such that the omission or incorrect placing of any part when assembling the lamp may be readily noticed. Provision shall be made for the protection of glass chimneys against breakage by expansion or by shock.

(1) *Lock.* Lamps shall be provided with a magnetic lock that is adequate to prevent the loosening or removal, from the locked lamp, of any part vital to safety.

(2) *Gauzes.* If gauzes are used they shall be adequate for the safety required. Adequacy will be determined by tests in moving and still mixtures of Pittsburgh natural gas and air, and by inspection of the gauzes relative to the following:

(i) The material of which the gauzes are made.

(ii) The gauze mesh.

(iii) The fabrication of the gauzes, particularly as to uniformity and distortion at seams.

(iv) The relative dimensions of inner and outer gauzes.

(3) *Glasses.* The adequacy of the glasses will be based upon the following:

(i) *The quality and form of the glass.* The glasses shall have smooth surfaces throughout and should be clear. Their ends should be parallel and at right angles to the axis of the glass.

(ii) *Resistance to breakage.* The glasses will be tested to show their resistance to mechanical blows, both alone and when assembled in the lamp, and to sudden temperature changes, such as being sprayed by water at a temperature 85° C. lower than that of the heated glasses.

(iii) *Identification.* The glasses shall be marked distinctly and permanently by a name or design, by which they are to be designated commercially.

(iv) *Protection of the glass against breakage.* Standards or other means used for protection of the glass should protect the glass from breakage except under a direct blow against the glass.

(4) *Bonnet.* (i) The lamp shall be equipped with a bonnet to shield the gauze from the direct action of air currents. The adequacy of the bonnet will be determined as follows:

(ii) The completely assembled lamp will be suspended as a pendulum, the point of suspension being 6 feet above the center of the bonnet. The lamp will be withdrawn 45 degrees from the vertical and allowed to swing freely against the edge of a rigid, flat steel bar one-fourth inch thick, the edge being vertically under the point of suspension. Inward deformation of the bonnet from its normal shape or position shall be not greater than 10 percent of the original outside diameter of the lamp bonnet. The lower openings of the bonnet shall not be materially distorted by this test.

(5) *Performance.* The lamp shall give the following performance:

(i) It shall give positive evidence of the presence of methane and of deficiency of oxygen in mine atmospheres, either through observation of the flame or by a suitable attachment, showing a definite indication in concentrations as low as 1 percent methane.

(ii) It shall have a free-burning, steady flame, sufficient fuel capacity to give 12 hours burning per filling with its normal flame, and a wick adjustment that is simple and dependable.

§ 21.7 Material required for MSHA records.

In order that MSHA may know exactly what it has tested and approved, detailed records are kept covering each investigation. These include drawings and actual equipment, as follows:

(a) *Drawings.* The original drawings submitted with the application for tests and the final drawings which the manufacturer must submit to MSHA before the approval is granted, to show the details of the lamp as approved. These drawings are used to identify the lamp in the approval and as a means of checking the future commercial product of the manufacturer.

(b) *Actual equipment.* (1) If MSHA so desires, parts of the lamps which are used in tests will be retained as a permanent record of the investigation and of the lamps submitted.

(2) If the lamp is approved, MSHA will require the manufacturer, as soon as his first manufactured lamps are available, to submit one complete lamp, with the approval plate attached, as a record of his commercial product.